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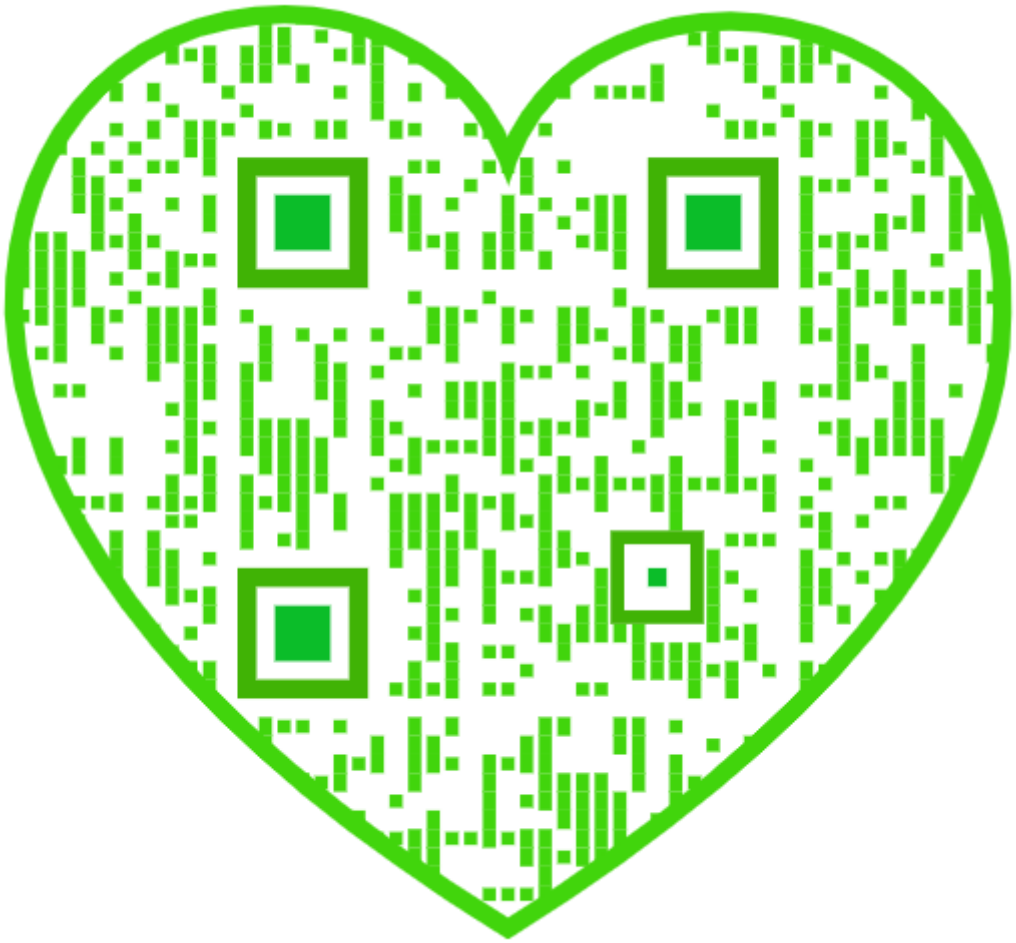
HOW TO REPAIR SHOES

By FRANK L. WEST



HOW TO REPAIR SHOES

BY FRANK L. WEST
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TUSKEGEE NORMAL AND INDUSTRIAL INSTITUTE

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PREFACE

Finding that there was nothing in the form of writing and illustrations which I might use to keep constantly before my pupils while teaching them how to repair and make shoes, I set to work compiling a set of lessons which would meet this immediate need. The lessons on the following pages are planned so as to take one from the very first steps of caring for a shop and making waxed ends to the place where he is ready to make a shoe. Upon each step illustrated herein, a great deal more might be said. My main object, however, is to put, in a clear, compact way, the essential facts.

This book is dedicated to the thousands of young men who are anxious to do common things in uncommon ways.

Yours very truly,

Frank L. West

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By Frank L. West

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HOW TO REPAIR SHOES

THE PROPER WAY TO KEEP A SHOE SHOP

A Shoe shop should be kept clean as any other place of business. A clean swept floor, clean, clear corners, bright walls, clean windows and everything straight and in place go to make a pleasant shop to work in and a pleasant place for people to visit.

Show me the inside of a shoemaker's place of business, and I will be able to tell you to a great degree the kind of customers he has and the class of work he does.

The shop should be well ventilated and lighted for the sake of the workmen's health. There should be set or special hours during the day for sweeping and arranging things. Often a workman's work seems a burden because things are not tidy and straight. When putting down a pair of shoes, set them straight with insides together. The little things count. A bright, pleasant

shop is the first step towards making work a pleasure.

1. Always sweep from the front door towards the rear end of the shop.

2. The easiest way to sweep is to move everything, placing it in its proper place as you go so that when you are through everything will be straight. When possible cover all machines while sweeping.

3. Never leave the work bench without leaving everything straight.

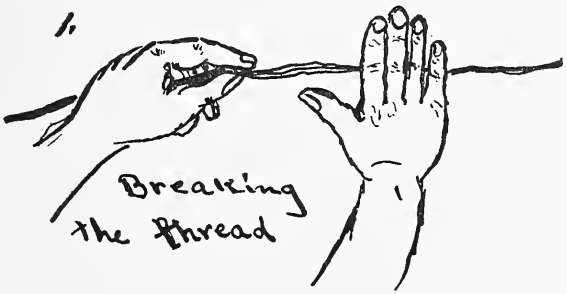
4. Never keep heavy tools, such as iron lasts and lap-irons on your bench. Have bench system.

MAKING A WAXED END

The threads which shoemakers use are called "ends" (warped thread twisted) and are made of two or more threads or strands of smaller thread, or flax, as it is called.

The first thing in making an end is breaking the flax. To break the flax, hold the main part, which is to be broken for the end, in the left hand, firmly gripping it where

you want it broken, between the first finger and thumb so that it will not turn beyond that point. With the right hand, lay the part of flax which is attached to the ball on the knee and roll it from you. This will cause the small flax fibers to separate, thus enabling you to break it easily. When the fibers separate give the thread a light, quick jerk and it will break. When the thread



breaks pull it apart gradually so that the fibers will taper. See Diagram No. 1 for breaking.

When putting threads together lay them one just behind the other so that the end

will have a very fine point. See Diagram No. 2.

Putting the threads together

Roll the end with the same movement as shown in Diagram No. 1, only allow it to turn between the fingers of the left hand. After rolling or twisting, wax well.

TO PUT ON THE BRISTLE

To put on a bristle, wax the fine ends well to the point. Catch the bristle, holding head in left hand, pull the wax toward the end briskly, thus waxing only the part to

which the thread is to be fastened. Take the bristle between the first finger and thumb, Diagram No. 3, and catch the fine

part of thread with it. Twist thread and bristle well together, slanting to the end. Stick hole in thread and pull bristle through to fasten it. See Diagram No. 5. After fastening thread, cut off heads of bristles and sandpaper the ends.

SOME POINTS TO BEAR IN MIND ABOUT WAXED ENDS

Never make an end longer than is necessary to sew a shoe. If an end is long enough to sew two shoes, double the amount of work is done by pulling the double end through the first shoe. By doing this, the end will have to be pulled two or three times more than necessary. The second shoe, when sewed with such an end, is never as strong as the first one.

The thread grows weaker and weaker as it is used. The second shoe gets the dead thread.

When sewing, keep the thread well waxed. When the thread is well waxed, the awl is not too large, and the end is pulled up well, the shoes seldom rip.

TO MAKE THE PLAIN STITCH

1. Push the awl through the leather from the right side.

2. Put the left-hand bristle through and then the right-hand bristle.

3. The left-hand bristle should always be

in the side of the hole which is farthest from you.

4. Catch hold of the bristles and pull them through.

5. After they are well through, catch the end below the bristles and finish the stitch.

6. Pull the end up well and hold it until you can feel the wax set.

7. After the first stitch is made, the bristle from the left hand will always come through on top of the stitch, or end, on the right side.

8. Keep the hands free from grease while sewing with a waxed end.

9. Always sew towards you.

THE STUDY OF DIFFERENT AWLS

Shoemakers use four kinds of awls, namely: Pegging-awl, Stabbing-awl (or straight-awl), Sewing-awl (inseamimg or whipping-awl) and the Stitching-awl (or square-awl). The Pegging-awl is used to drive holes in the sole for pegs. It is sometimes used to make holes in the heels before the heel-nails are

put in. The Stabbing-awl is used in sewing rips in the upper of a shoe and any other kind of sewing which is to be done in straight, flat material. The Inseaming-awl is used when sewing the welt on a shoe, sewing a patch down to the sole, and in some cases when sewing the sole on the shoe. The Sewing-awl is round or oval shaped at the point. This awl will make stitches which have a tendency to run into one another. For this reason it is better for making long stitches such as those on the welt. The Stitching-awl is used for stitching on the sole. This awl (the Square-awl) makes a square hole which allows you to make a very fine stitch when sewing on the sole. The flat or square hole does not allow the stitches to run together.

When sewing, no awl should be used which is as large as the two ends put together. The hole which the awl makes must be so small that the threads will offer resistance when being pulled through. (The threads will have to be pulled hard to get

them through.) Always be sure that the awl is small enough.

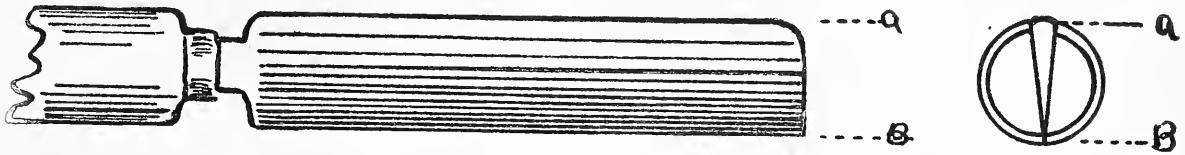
The right sized awl, with an end well waxed and pulled up (until it sets) are two things which are necessary to make a good strong stitch.

HOW TO SHARPEN KNIVES

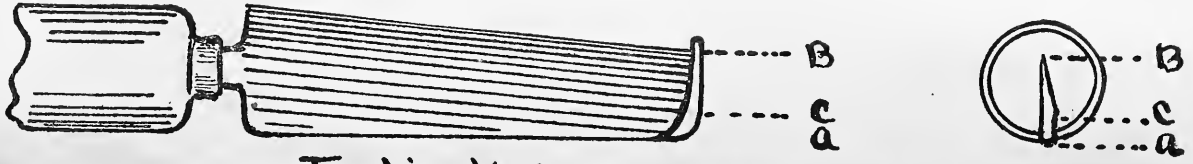
Diagram at top of page 16 tells you not to begin half-way the blade to sharpen a straight knife. Why? Because beginning at that point, you will in a short while have a knife with a blunt or dull edge. The knife will seem to be made of poor metal. In order to make a knife cut, we must sharpen it from A to B according to diagram so that the blade can gradually work its way through the leather. A thick blade coming to a point all at once cuts hard, therefore, bear in mind that the knife must be held flat on the stone or sharpener in order to get the right shape as shown in diagrams.

Note the diagram of the lip knife. It is sharpened to a bevel on the side that cuts

How To Sharpen A Knife



The Square point Knife



The Lip Knife

next to shoe only half-way and held flat on the outside. Thus a lip knife is sharpened like a chisel.

There are two movements in cutting, forward and downward. A butcher never cuts a slice of meat without pulling his knife in two directions, across the meat and down through it. The chisel is made to cut by pressing it downward and across the wood.

THE SQUARE-AWL LIKE THE KNIFE AND THE CHISEL

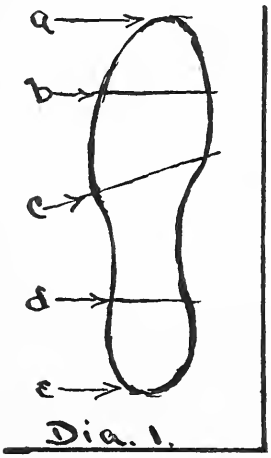
The Square-awl must be sharpened so that the effects of these two movements can be gotten so that it can cut its way through the sole. Since the blade is flat or square, it cannot be turned in its place, or be pulled across. The blade must be cut off at an angle, i. e., it must be sharpened so that the point on the outside of the curve will be sharp and to a point, tapering to the inside of the curve. This will allow a straight, steady pressure on the awl to have the same effect as that gotten by the two movements in cutting with a chisel and knife. Thus, the awl cuts its way through freely.

THE DIVISIONS OF A LAST

Since shoes receive their shape by being formed over the last, it is best that the divisions of the last be given some thought.

The last is divided into four parts; namely, The Toe, Ball, Shank and the Heel.

Diagram No. 1 shows these parts and their shapes.



Dia. 1.

Dia. 2.

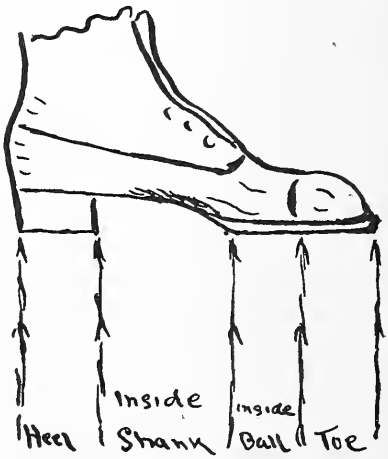
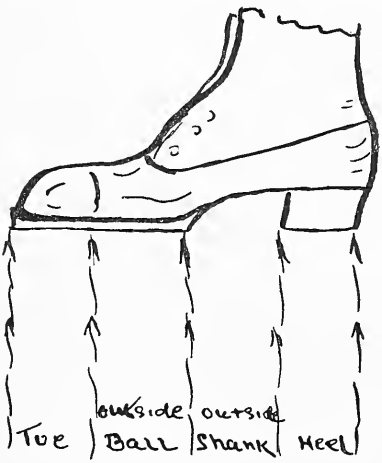


Diagram No. 2 shows the length of the inside of the divisions as compared with those of the outside. Notice the long shank and short ball.

Diagram No. 3 shows the outside of the

Dia. 3.



divisions and the effect they have upon the shape of the shoe. Notice the short shank and the long ball.

Always remember that the ball of a shoe is longer on the outside having a short shank. The ball is shorter on the inside having a long shank. Compare outside and inside Diagrams 2 and 3.

THE FRENCH HAMMER, WELT-KNIFE AND RHAN-FILE

The French hammer has a round ball face. When heavy, it is used for beating and moulding the soles in shape. When light, it is used for hammering in rounded places such as the shank.

The Welt-knife is used for trimming the upper surface of the sole along the welt (or the part next to the upper). It is sharpened the same way as the lip-knife.

The Rhan-file is used for smoothing surface after the Welt-knife has been used.

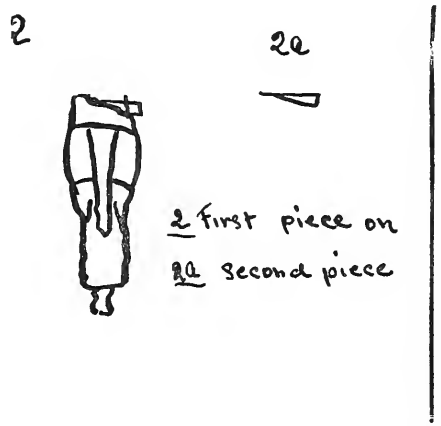
REPAIRING A HEEL

The heel, being more directly under the body and the first to strike the ground, generally wears out first. For the above reason, much care must be taken to see that good leather and solid work is put into it.

Pull off the worn top-piece and see that what is left is hammered down solidly. Next

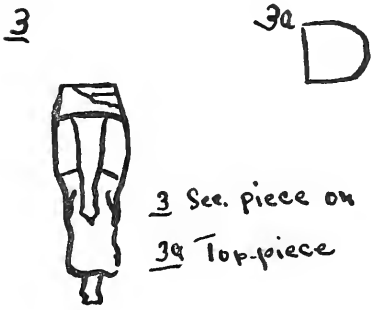
split a piece of solid, easy-cutting, scrap sole leather, so that two pieces can be gotten out of one. Put them on the shoe as shown in Diagrams Nos. 1 and 2; fasten them on well, piece by piece, with tacks. See that

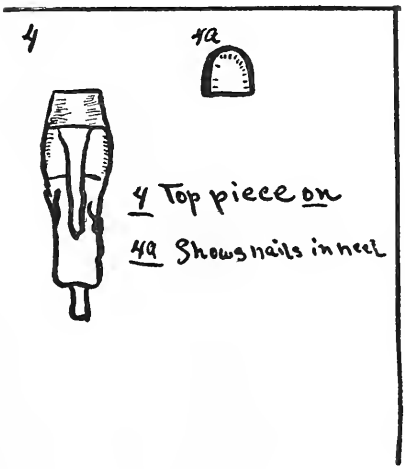
the heel is level before putting on the top-piece. (In some cases, if necessary, a small piece can be put under after the top-piece has been trimmed.) After it is level, put on top-piece, trim in shape, then draw guide line and nail down.



Always put the nails thicker on the side that is worn down most, to protect the heel.

Rasp the heel well and in shape; smooth with buffer and sandpaper. When finished, it should set level (Diagram No. 6) unless you are ordered to leave it otherwise by the wearer.

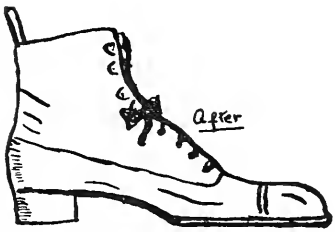

3
3a
3 See. piece on
3a Top-piece


4
4a
4 Top piece on
4a Shows nails in heel

5.

5 shows heel as it should look behind

6.



6 shows heel as it should look from side. always level

HOW A McKAY SEWED SHOE IS MADE

The Mckay sewed shoe is made on the same principle as a nailed shoe. The leather for the inner sole or the foundation of the nailed shoe need only be strong enough to hold the clinched nails.

This inner sole is placed on the last and trimmed in shape first; after this the upper is lasted over the last and tacked down with short tacks. The upper is pulled over at least one-half inch so that the nails in outer sole can catch it. The space on the inner sole that is not covered by the upper leather is filled in with tarred felt or some other material that will be water proof and at the same time serve to stop the crying of the soles.

This shoe may or may not have a middle sole. The middle sole (or slip sole as it is often called) is put on the shoe next and allowed to extend back just beyond the shank line. At this end it is trimmed down to a

feather. Tacks are used to fasten this sole in place. The outer sole is next put on and trimmed in shape. This, the outer sole, is then nailed on the shoe with nails that are long enough to go through the middle sole and clinch on the inner sole, catching the upper at the same time.

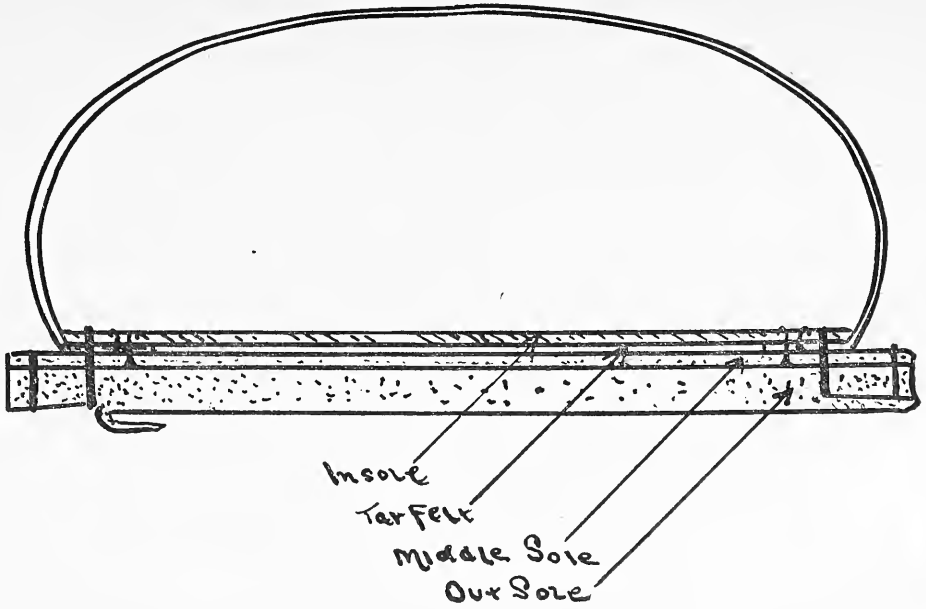
The only differences between the nailed shoe and the McKay sewed shoe are these:

THE McKAY SEWED SHOE

1. The middle sole is not fastened securely when it is first put on. 2. The outer sole is fastened on with a thread which goes through and catches the inner sole. This thread takes the place of the nails in the nailed shoe.

Notice the cut on page 27 of cross section of the McKay sewed shoe. At the left side the channel can be seen turned back. The heavy black line which passes through the outer sole, middle sole and the inner sole represents the stitch that is made on the McKay machine. This stitch holds the outer sole on. This stitch takes the place of the nails in a nailed shoe. The short heavy

Cross Section Of McKay Sewed Shoe



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black line at the left end of the sole which does not pass through to the inside of the shoe represents a set of stitches which are sometimes put on the shoe in order that it might appear as a shoe with a welt to it.

The right side of same cut shows the sole with the channel closed and covering both sets of stitches.

PREPARATION OF SOLE LEATHER

All sole leather should be put in case before it is used. Good soles often fail to give the service they should when they are not properly prepared before being put on the shoe.

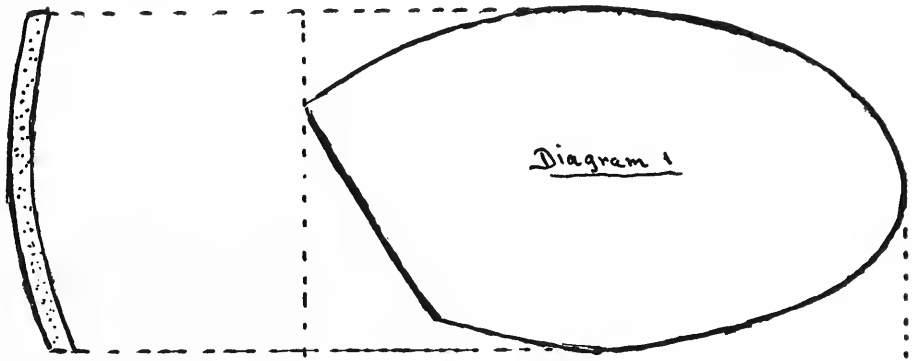
The first step towards the preparation of sole leather is wetting it thoroughly, in other words, put it in water and allow it to remain until it is wet through. After this take it out and set it up so that all of the water can drain out that will. It is better to wet leather the day before it is to be used so that it will have one night at least to set and mull. When it is wet the day before using, it should be allowed to drain and wrapped very close in cloth or paper to prevent it from getting too dry for use. If it is kept close it will remain moist and cut like cheese. In this stage the best results can be gotten in workmanship.

MOULDING

All soles should be cut in rough shape be-

Cleaning And Moulding The Sole

The Sole must be Cleaned, All of the meaty part shived off and then hammered To make it more compact. It must be hammered in shape



Dia 1 Shows Sole after it has been trimmed and hammered

Dia 3 Shows an end view of sole as it will look when properly hammered in shape

Dia 2 Shows a side view of sole as it looks when properly hammered

Diagram 2

fore being put on the shoe and all meaty substance trimmed from them. In trimming away the meaty substance (if there should be any) be sure and see that the sole is made the same thickness all over. After this the sole should be hammered out for two reasons: first, to make all of the grains of the leather more compact; and second, to mould it into shape so that it will lay close to the shoe all around the edges. The sole should be moulded so well that there will be nothing to do when nailing or sewing it on but fasten it where it is. Diagram on page 30 shows three views of the sole after it has been trimmed in rough shape and moulded.

Too much attention cannot be given to the preparation of sole leather. The shoemaker who understands how to prepare his leather properly and does it at all times will be sure to win customers.

Under no circumstances is it wise to take sole leather right out of the water and put it on the shoes.

HALFSOLING A SHOE (NAILED)

The shoe that is to be halfsoled first is a McKay sewed shoe. It should be borne in mind now just how the McKay sewed shoe is put together as stated in previous lesson.

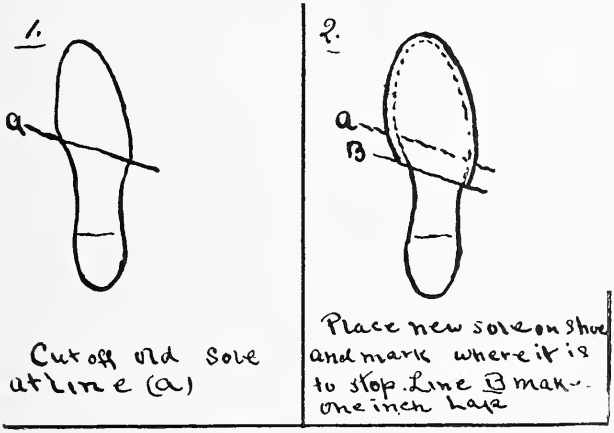
The first thing to do is to cut off the old soles. Be careful to see if there is a set of stitches on the outside of the middle sole; if so, be sure to cut them between the middle and the outer sole.

CUTTING OFF THE OLD SOLE

To cut off the old sole stick the knife between the soles at line *a* (see Diagram 1) and cut the soles apart around to the opposite side of shoe to same line; hold the old sole back with one hand and cut off at line *a* making sure not to cut towards the upper. Line *a* (Diagram 1) represents the shank line or the imaginary line where the forepart and shank meet. If the sole is cut off at this point the new sole can be cut by it with an allowance for an inch lap which is best for making a substantial joint.

INSPECTING THE SHOE

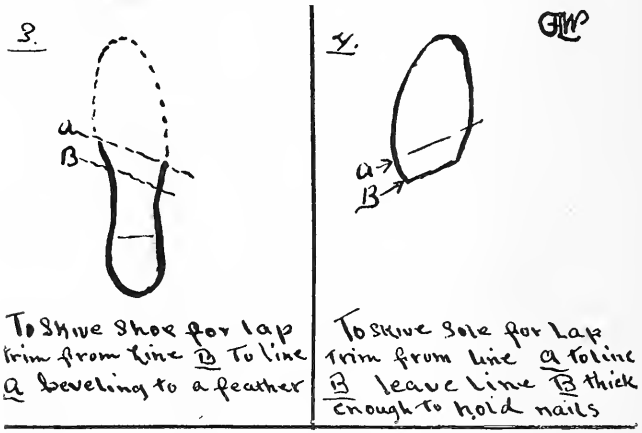
It is now time to inspect the old shoe to see if there is anything wrong with the foundation. See if the upper is worn around the edge of the inner sole; see if the middle sole has been worn too thin at some point. Everything must be put in first-class condi-



tion before putting on the new sole. The shoe should be leveled and the inner sole should be tested to see if it is sound enough at all places to hold the nails that are to be put in the outer sole.

FITTING ON THE SOLE

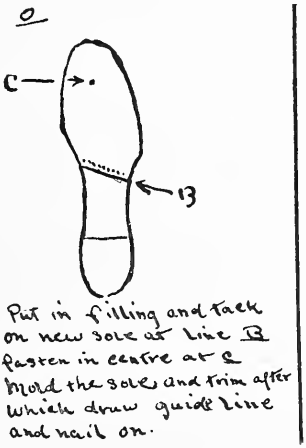
In fitting on the sole it is best to skive the new sole that is to be put on first so that if something goes wrong the place for sole can be moved up a little. If the shoe is



skived first the sole cannot be made longer and a bad joint will be made. See Diagram 1 to 4. Care should be taken to see that the new sole is cut thin enough at line *b* on Diagram 4 to make a neat joint and yet left thick enough to hold the nails which are to fasten it across the shank.

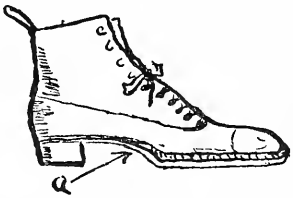
After the soles have been skived, tarred felt

should be put between soles to keep the shoe from crying. The felt should be made thin enough to avoid any bumps in the sole. Fasten the sole on across the shank; drive one nail in the middle of the sole at the toe about one inch from the end; trim the new sole square with the middle sole (or square


C
B
Put in filling and tack on new sole at line B fasten in centre at C Mold the sole and trim after which draw guide line and nail on.

with the shape of the inner sole in case the shoe has no middle sole), leaving it about one-sixteenth of an inch larger all around so that the edges can be rasped up without making the sole closer to the upper than it was at

first. After the sole is trimmed, draw a guide line around the edge of the sole for nailing far enough from the edge to allow the nails when driven in to strike about the same place where the McKay stitch was. Be sure



Rasp and finish the edge of sole. Point a shows how the sole will look at the joint when properly fitted and finished

in nailing that the shoe is level on the iron last. Many times the shoe is hammered out of shape and the nails are not clinched because the last is not directly under the nail. This happens mostly on the outside of shoe.

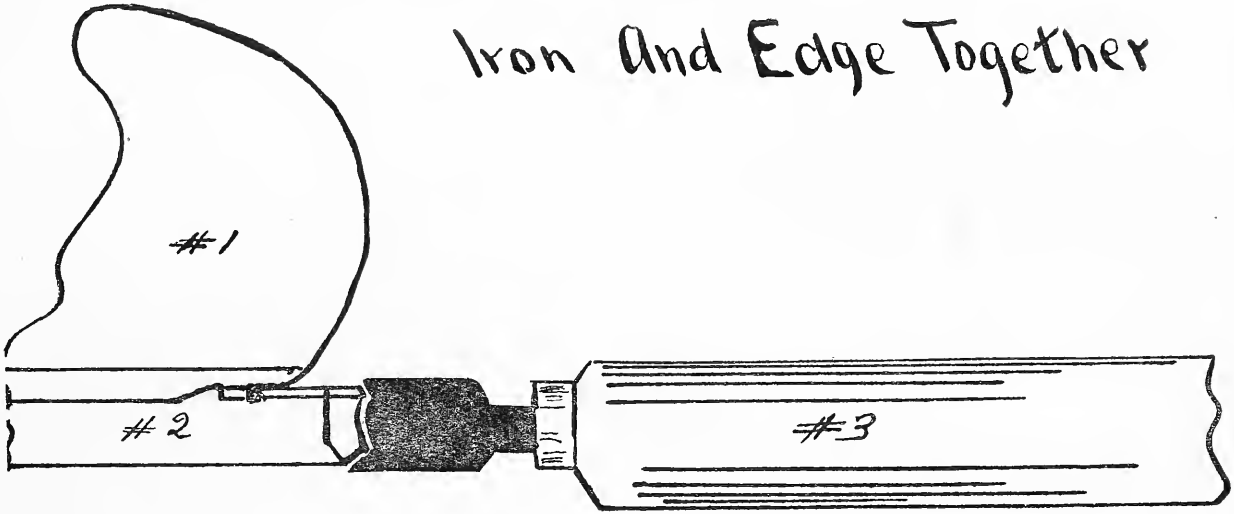
PREPARATION OF THE EDGE

After the sole is nailed on and the bottom is made level, prepare the edge for the iron. The iron should be smaller than the sole as it now stands. The sole is first rasped up until it blends with the middle sole. After this the edge is buffed until it is smooth. The surplus on top of middle sole is trimmed off with the welt knife and rubbed down with the bone. The bottom edge of the sole is next trimmed off to fit the guard of the edge iron. This bottom can be smoothed with the fine part of the rasp, after which it is buffed. The edge is now sandpapered until very smooth.

SETTING UP THE EDGE

It is better before applying the edge ink to first set up the edge by moistening it with a wet sponge and then using the warm iron. This, the first setting, enables the workman to be sure that his edge is right before applying the ink. The ink is afterwards applied and left to stand until nearly dry. At this stage the warm iron is again rubbed over it

Iron And Edge Together



The above drawing shows iron just as it should fit the edge

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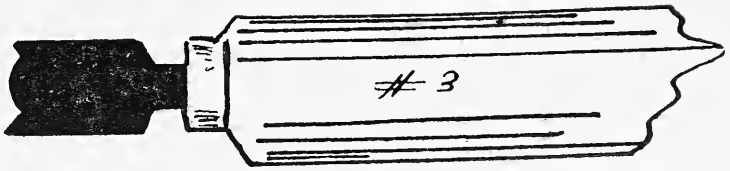
Iron And Edge Separate



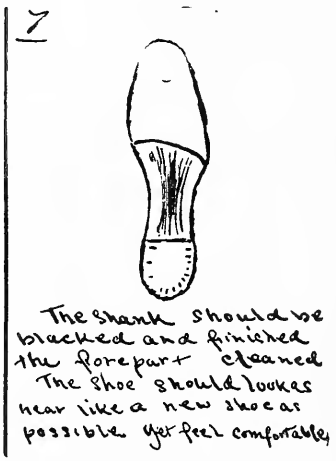
The above drawing shows the impression on edge made by the iron.

No. 1 upper

No. 2 sole

No. 3 edge iron

until the edge is burnished to a high polish. In order to do good burnishing the shoe must be held firmly in one hand and the burnishing iron equally as firm in the other and rubbed back and forth with a square, sturdy movement.



CLEANING THE BOTTOM

After the edges are burnished (or set up) the bottom is cleaned by rasping the surface of sole over the nails with the fine flat side of the rasp to get the nails smooth with the leather. Next buff the top surface from the sole with the grain, making sure that the im-

pression which the guard of the iron has made is left on the edge. After the bottom is clean, smooth it with sandpaper. The bottom should never be sandpapered until it is dry when a clean white bottom is wanted. In order that the shoe might appear neat it is well to make a line across the sole at the shank line (line *b* Diagram I) and apply a gloss polish over the shank to this point. The fudge wheel should be used around the edge of sole to give the job a finished appearance.

THE BACK AND LOCK STITCHES

The Back Stitch is used on common rips when the shoemaker has no machine on which to do repair work. Diagram No 1. shows the most common place where the stitch is used.

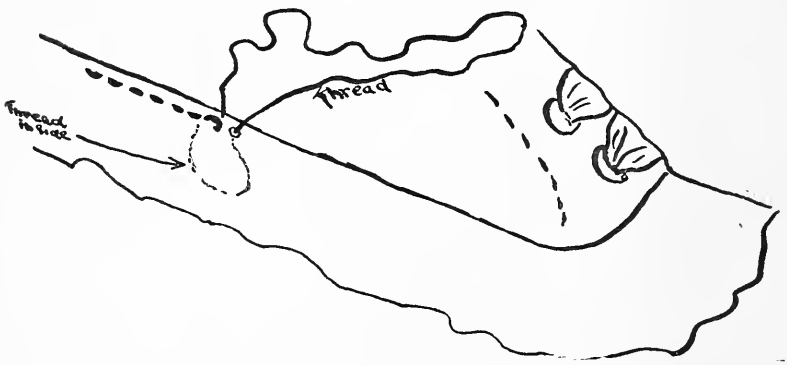


Diagram No. 1

In making the stitch, use a single thread with a needle. To sew, leave the knot on the inside and pull the needle through to the outside. With your awl, make a hole and carry the thread back through, thus making one stitch. Make another hole and from the inside bring the needle back to the outside.

At this point, the awl will have to be stuck back in the second hole by the other stitch in order to make the second stitch. This back movement gives the stitch its name, Back Stitch. See Diagram No. 1.

"THE LOCK STITCH"

The Lock Stitch is mostly used when the upper is ripped loose from the welt at the sole. In this case, a row of stitches is made along the edge of the upper, into which a second row of stitches is locked (or sewed through). Do not catch enough upper to cause the shoe to wrinkle when being sewed down. The second stitches are made through the sole, and the upper is pulled in its place by the first row. The stitches should be pulled down to where the upper and welt meet. See Diagram No. 2. Always see that the upper is dampened before beginning to lock-stitch. A stabbing-awl is used to make the stitches in the upper when lock-stitching. The inseaming-awl is used to lock the upper to the sole. Always sew toward you when

putting in the stitches in the upper, so that when you begin to lock it down, you will be sewing toward you in the sole. Always use a heavy end in lock-stitching—from 8 to 12 strands.

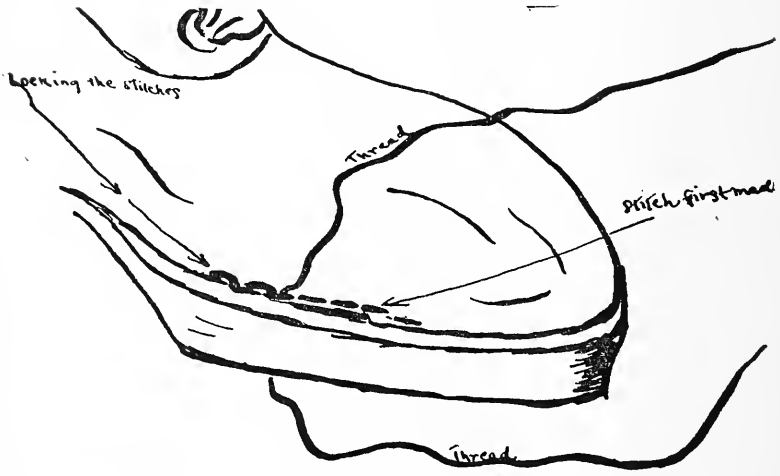


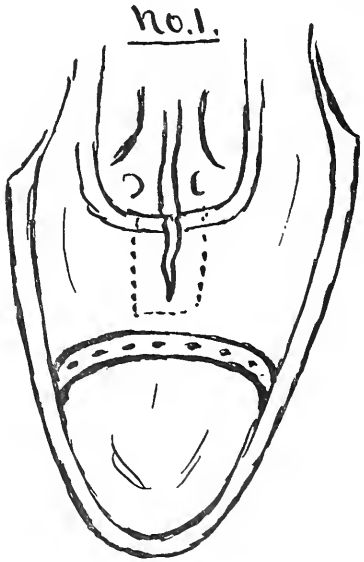
Diagram No. 2

THE UNDERNEATH PATCH AND THE BACKBONE STITCH

Frequently there are places to be repaired which call for a patch between the upper and lining of the shoe. Such a patch we will call the underneath patch. The job will be strengthened by stitching the place down with the backbone stitch. Diagram No. 1 shows a place which has been broken in the vamp at the front of the shoe. This is a most common place to use such a patch and a very delicate place to repair.

To repair this, rip the vamp from the quarter on both sides of the broken place far back enough to allow a patch to be put under or between the upper and the lining. Before putting the patch in its place (dotted lines in Diagram No. 1 represent the patch in its place) sandpaper the top surface so that it will take the cement. After this is done put the patch in its place and, with a small wooden paddle, distribute channel or rubber cement over the two surfaces that are to be stuck together.

After the cement has set a while, stick the parts that have ripped apart back together. Make special effort to join them as they were at first.

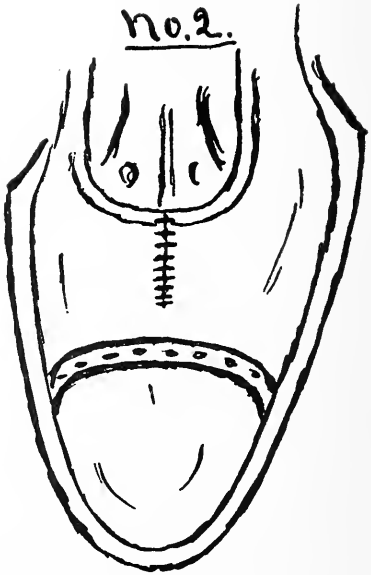


No 1. Shoe bursted at vamp
Dotted lines show patch put
between Lining and Vamp

THE BACKBONE STITCH

To make the job strong and at the same time neat, the parts should be stitched down with the Backbone Stitch. In making this stitch (See Diagram No. 2) the place is first whipped together, catching the material through to the lining of upper. This is done with one end and the stabbing-awl. The stitch is made just as the back stitch is made, only it is put in across the broken place. Be sure and keep the stitches straight across the place on the outside and the same length.

After the place has been whipped together, the stitching down is done. With the same end sew down the stitches. This is done with the back stitch catching every other stitch through to the lining and pulling it down in the joint of broken place as though you were driving the stitch down with a staple. After pulling down every other stitch go back and catch the rest the same way. When through cut off thread and beat the place down lightly.



No2 Vamp stitched together with Backbone Stitch catching patch between lining and vamp

SHOE LEATHERS

The skins which are most commonly made into leather for the purpose of making boots and shoes are taken from the steer, calf, horse, colt, goat, sheep, lamb and kangaroo. These skins are called "hides," "kips" and "skins." The skins from the larger animals such as the steer and horse, are called "hides." Skins which come from the half grown steer or cow are called "kips."

The skins from smaller animals such as the goat, sheep and kid are simply called skins.

The skin of the steer is most generally made into sole leather. Whenever it is used for upper leather, it is split. Splitting causes it to lose much of its durability.

Calf skin is not split; it is noted for its durability. Nothing better could be wished. This skin is tanned whole.

Skins from the horse and colt are also very strong. Neither of these is used for sole leather.

Goat skins are uniform in texture and strength, and are very generally used. For

real fine work, the kid skin is used. The finest grained skin is gotten from the kid before the animal has had any food except that gotten from its mother.

Sheep skin is quite spongy and pliable. This does not make such a strong leather. Cheap grades of soft shoes are made from sheep skin.

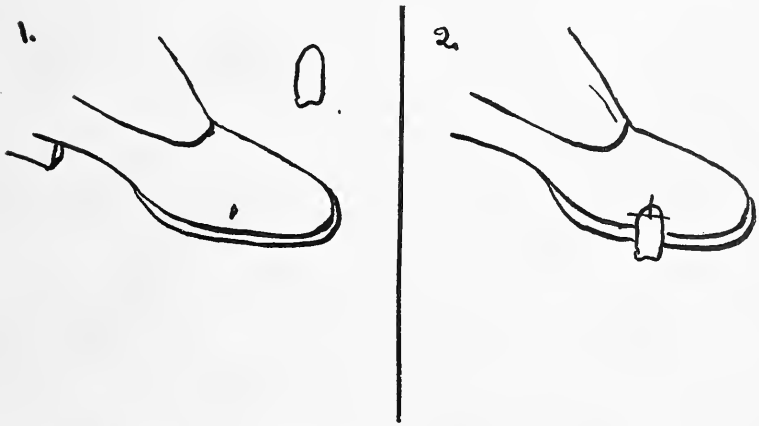
The lamb skin makes a very fine grained leather if it is taken from the animal before it is one month old. After this age the skin begins to get coarse.

The kangaroo skin makes a very tough and durable leather. It stretches but little although it is quite pliable.

The animal which is exposed to the weather most and which has to exert itself most for its living always produces a skin of superior quality.

PUTTING ON A CEMENT PATCH

As a rule, shoemakers consider cement patching a hard job and try to avoid it. Most of the time they would rather sew a patch and spoil the looks of the shoe than take pains to prepare the patch properly for cementing.



The very first step is to select a patch from the same material that the shoe is made of so that the fibers will cohere. Next see that the part to be patched is clean and dry. Tighten the place with stretchers. Now proceed according to diagrams.

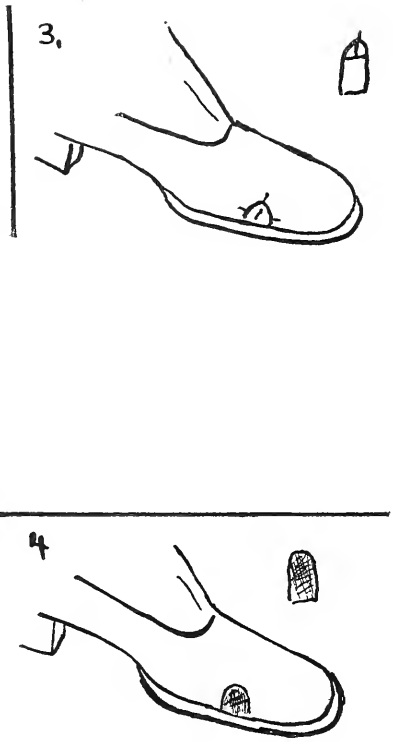

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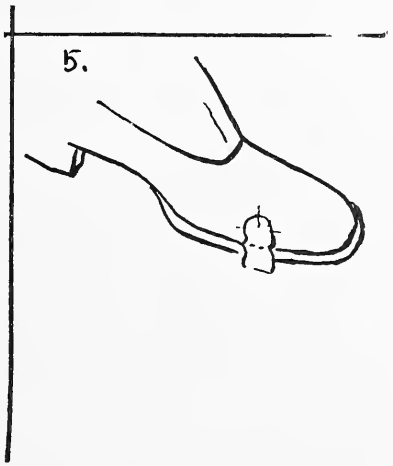
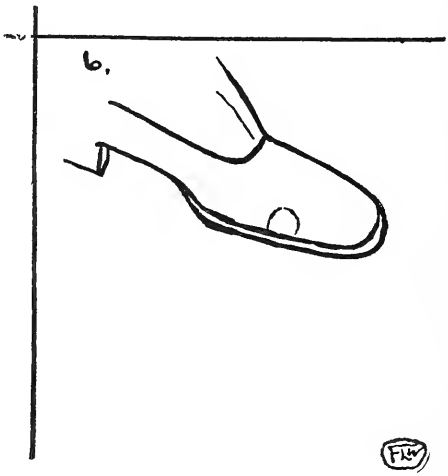
Diagram 1. Skive patch in shape desired, bringing outer edges to a feather. Diagram 2. Lay patch over the hole and mark place with crayon; make cross guide lines with pencil. Diagram 3. Take off the patch



and skive the shoe. Diagram 4. Put cement on patch and shoe; distribute evenly with small wooden paddle. (Note: Be sure and keep cement well corked. The thumb should be held over the mouth of the bottle while cement is being used.) Let the cement turn white on shoe and patch. Diagram 5.

Warm patch and shoe with an even heat and place together making guide lines meet. Press firmly together all over and smooth



well with warm heel-burnisher. Diagram 6. After patch has set well, sew it down to sole well back and trim off surplus leather.

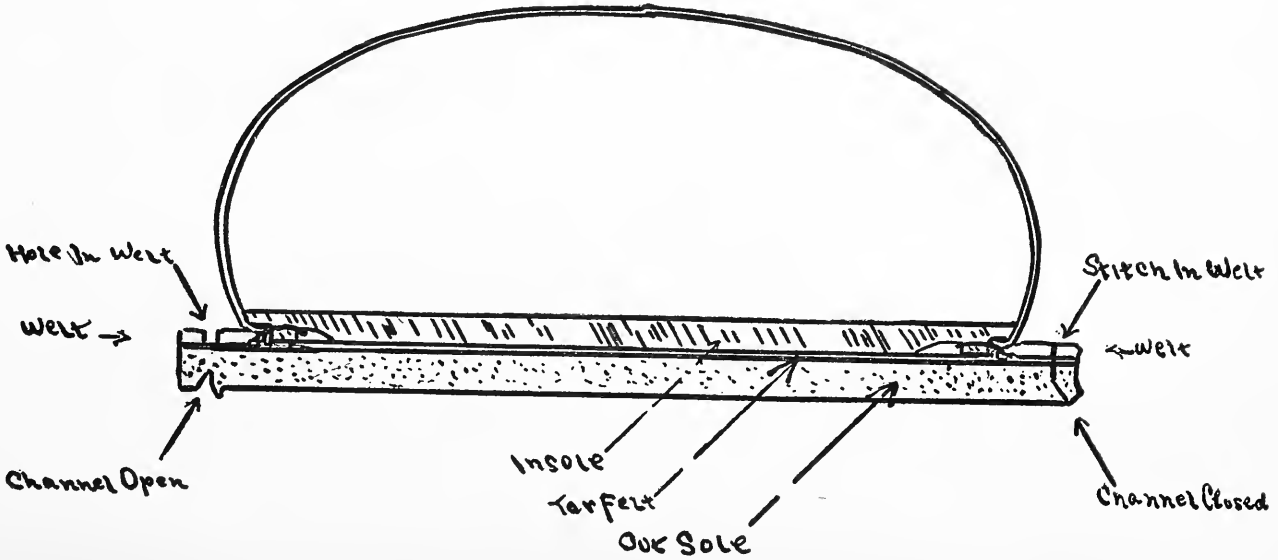
HALFSOLING A SEWED SHOE

Cut off old sole and pick out the old stitches. Cut off all double soles next to the welt and pull the middle sole from the outer sole. This will leave the stitches out of the middle sole. Test the welt all around. If found to be weak at any place, it should be re-sewed.

First, fit on the sole as usual, having the sole well moulded to the shoe and the filling in. Trim the sole, leaving it a little wider than the welt so that the edge can be worked on without cutting the welt closer to the shoe. After trimming the sole, make a guide-line for cutting the channel close enough to the edge of the sole to throw the bed of the channel directly under the old hole in the welt. See Diagram. Be sure that the channel is deep enough to hide the stitches. (Half the thickness of the sole is deep enough.)

When the bed of the channel is too far in and not directly under the old hole in the

Cross Section Of Goodyear Welt Shoe



F.L.W

welt, the sole will be drawn from the opposite side of that on which you are sewing, consequently, to sew the opposite side, the welt will be drawn down, causing the shoe to look much narrower, and in most cases, to become much tighter. This one point has caused many shoemakers to lose customers. The work was neatly done by them, but the shoe was left with a narrow welt and a very uncomfortable feeling.

The channel, when cut, generally is about 1-8 inch from the outer edge of the sole. This space between the edge and the channel will be covered by the guard of the edge iron. This guard will make an impression which will hide the channel.

See that the welt is moist before beginning to sew. When sewing see that the stitches on the welt do not pull through, by pulling harder on the right-hand thread (the stitch on the sole). See to it that the awl is smaller than the two threads put together so that there will be a resistance when pulling them through.

After the shoe has been sewed, rub down the channel while the leather is yet moist. Some shoemakers use the bone to rub down the stitches in the channel before closing it. This operation causes the channel to be forced so wide open that it will be hard to close. If the stitches are put directly in the bed of the channel, there will be no need to rub them down before closing channel.

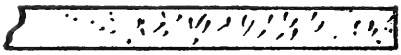
The job will not be complete until the edges are set up, shanks blacked; the shank-line and the joint of the soles fudged. The stitches must also be divided with the stitch divider or fudged to give the finish. Blacking the shanks is the last thing to do on a repair job. It is better to use a gloss polish. Put it on after everything else has been done sothat you will not have to wait on the shoe to dry.

How far from the edge of joint should the nails be put? How long should an end be for sewing on the average halfsole? Why is leather put in case before it is used?

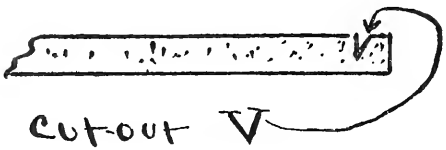
PREPARING AN INSOLE FOR A SEWED SHOE

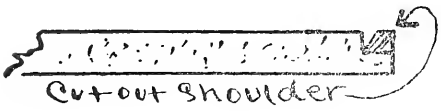
The insole is the foundation of the shoe. When selecting leather for it, much care must be taken in order to get material that is light, firm and flexible. Light, because no surplus leather is wanted; firm, because it holds the whole shoe together, and flexible, because the foot must have as little resistance as possible when a person is walking.

The insole is first moulded to the last and fastened to it with as many nails as are necessary to hold it properly in place. Two at the toe, two at the ball, one at the shank and one at the heel. (Some shoemakers use one at the toe, one at the ball, one at the shank and one at the heel.) Trim the sole well in shape by the outline of the bottom of the last. The width of the shank will be determined by the best judgment of the workman. Under the ball on the inside is always a place where much care must be taken. It is here where one is most likely to leave the insole



Cross Section of Sole

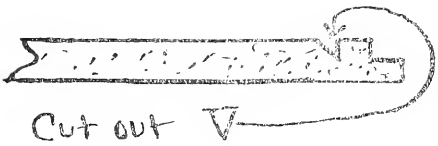


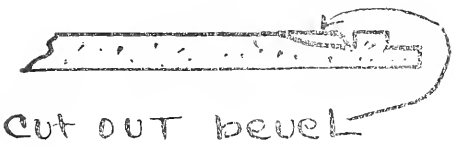


too wide. In order to get this particular place right, the sole will have to be trimmed under just a little; trim with the point of the square-point knife. This particular place, if not trimmed under just a little,will, after the shoe is finished, stand out from under the ball of the foot too much. By trimming it under, the foot is thrown directly over the inside bottom of the shoe. This particular point is explained more clearly in the next book, How to Bottom a Welted Shoe by Hand.

The bar on the average shoe is 1-4 inch wide; the shoulder is the same except in the shank, where it is made gradually wider in order that the stitches at this point might be hidden. When the shoulder leaves the shank and ball line it begins to widen until it reaches the middle of the shank, then it begins to blend back to its 1-4 inch width, ending just 1-8 inch beyond the heel line.

See diagrams for cutting the bar and shoulder. After making the line for shoulder as instructed above, make a horizontal


Cut out V


Cut out bevel

Hole in bar

cut in line half the thickness of the sole; make next a slanting cut so that a V can be taken out. This V will allow the lip of the lip-knife to run freely along the bar when taking out the shoulder. After the shoulder is cut out, make line for your bar 1-4 inch back. Make cut half the thickness of the sole; make second cut to take out V and cut out long enough bevel to allow the inseaming-awl to pass through the bar easily and come out flat on the shoulder. After the bar and shoulder are cut, punch the holes with the inseaming-awl 1-4 inch apart all around. Begin at the tip line to slant the holes a little toward the center (of toe) so that there will be plenty of room between the stitches at this point, and allow the holes on the outside of the bar to be 1-4 inch apart.

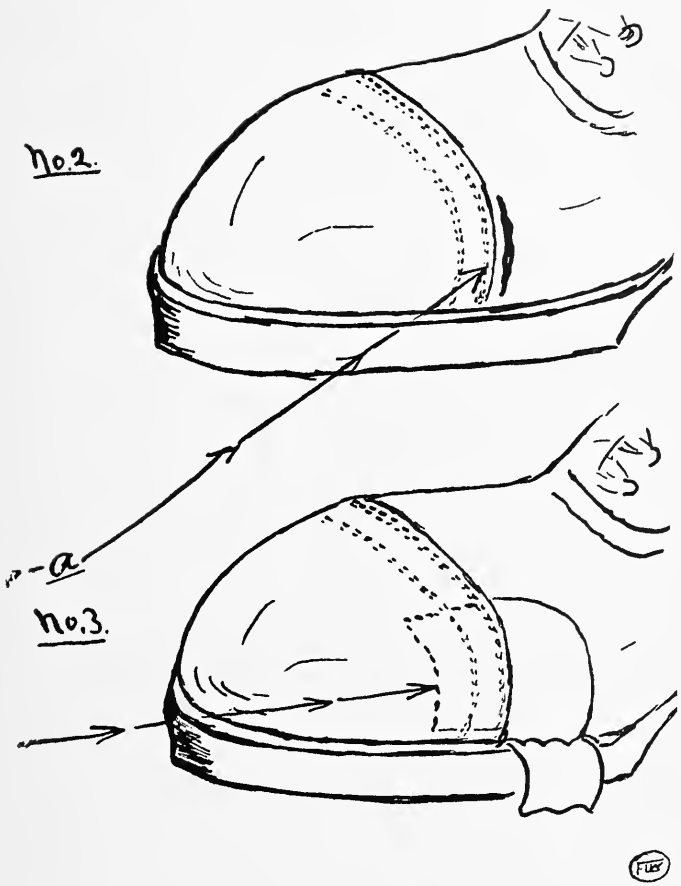
PATCHING A SHOE AT THE TIP

Often the desire to mend the place broken hastily causes the workman to lose sight of the fact that the wearer wants his shoe to look neat when he wears it.

No. 1. Represents the patch cut in proper shape to go under the tip

Patching a shoe which is broken just at the tip is quite easily done if the right steps are taken.

The same process is used generally when putting on cement patches. Before putting


No.2.
a
No.3.

in the stretchers to tighten the place (in this case) rip the tip loose so that one end of the patch can be put under as shown in Diagram No. 3.

Fit the patch, cutting it as shown in Diagram No. 1. In this case, put on the patch and let it set, after which take out the stretcher and push the part that is left to go under the tip in its place. See dotted lines showing patch stuck under tip in Diagram No. 3.

After this is done sew down tip again and fasten patch to the sole.

Another way to put on this same patch is: first, cut the patch as shown in Diagram 1. Skive the edges. Second, rip the tip loose and push the piece under as shown in Diagram 3. Third, sew the patch down at tip. Fourth, put in the stretcher and tighten place. Lay patch back down over the upper and rub crayon over it. Fifth, lift patch and skive shoe. Apply cement.

HALFSOLING A TURNED SHOE

Shoemakers generally dread to attempt halfsoling turned sole shoes. Many of them know how but do not care to concentrate their minds on the few small details of fitting on the soles. Others could do it and would do it easily if it were not for their being discouraged by some other workman. Repairing turned sole shoes calls for accuracy and doing the right thing always at the right time.

Leather that is used for turned shoes should be firm and flexible. It should be well in case. The work should be started when there is ample time to sew on both soles and turn the shoe back to its right shape and put it on a last before stopping.

Diagram No. 1 shows the shoe with holes in old soles before it is repaired. If the shoe has a cap, notches should be made on either side of the old sole and the places marked on the new sole to show how to get it (the cap) straight when lasting the upper. Rip the old

sole from the upper as far back in the shank as the new sole is to come; cut the threads towards the old sole to avoid cutting the upper. Do not cut off old soles yet. Cut the new sole (which is to be put on) in rough shape (Diagram 2); have the shank part in the shape desired. Place new sole

on old sole and fasten it temporarily to old sole as in Diagram No. 3. Trim new sole the shape of old sole, leaving it about one-sixteenth of an inch larger so that there will be something to work on when finishing up the edge. Diagram No. 3 shows new

sole fastened to old. Make guide lines across the shank end of new sole, extending them equal distance on the old soles. Make a line on old sole at bottom of new sole. These lines will show just where to place the new sole after the bar and channel have been cut.

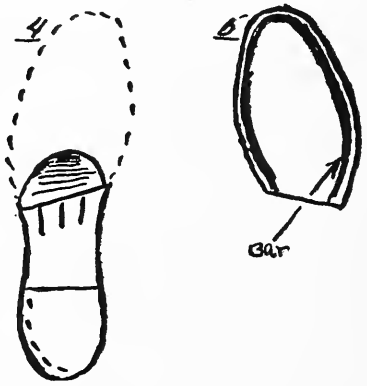
Diagram No. 4. shows the shoe with the old sole cut off. The old sole is cut off oval shaped or left longer in the center of the lap as shown in Diagram 4. The lap at the sides is left just long enough to allow one stitch to be made in the bar of the old sole.

CUTTING THE BAR AND CHANNEL

Mark the line around new sole for the shoulder. Make allowance for the one-sixteenth inch which was allowed on the new sole, that is, if the shoulder on the old sole is three-sixteenths of an inch wide; make the shoulder of the new sole one-fourth of an inch wide. Do not make shoulder on new sole wider unless the new sole is wider than the old sole.

To cut the shoulder see lesson on prepara-

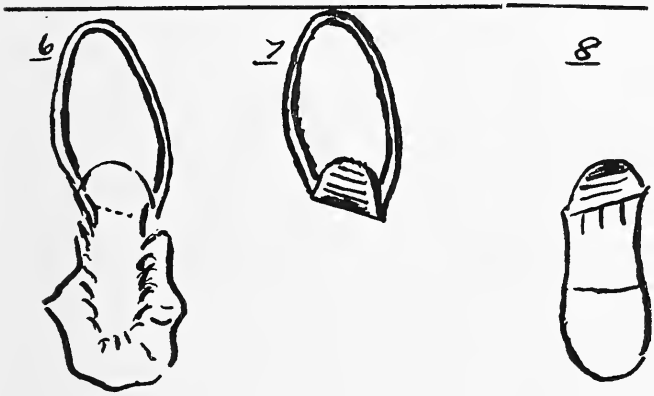
tion of an insole on page 61. On the turn sole after cutting the shoulder the V is not cut out behind the bar; instead, make a channel and turn it back so that it can be rubbed down over the stitches. Do not punch the holes in the new soles; these will be made as you sew; the old holes in the upper will guide



you. In some cases it is best not to use old holes; the desire to do an honest job and conditions will govern that part. Under normal conditions the stitches should be about one-fourth of an inch long.

SKIVING AND FASTENING ON NEW SOLE

After the bar has been cut on the new sole, skive the old sole down to a feather; do not cut out the mark which was made across old sole at the shank. The close lines on lap in Diagram No. 4 show that the lap



is skived thin. Next, place the new sole on old sole in its proper place, using the guide lines to help; mark the outline of the lap of old sole on the inside of the new sole. Diagram No. 6 shows old sole on new sole. Diagram No. 7 shows new sole with outline of

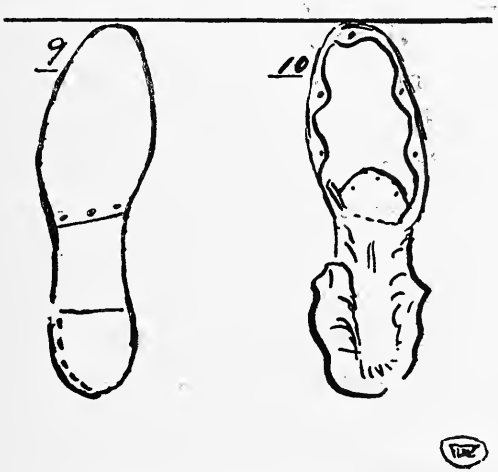
lap of old sole on it. The new sole is then skived from the lines to the shank. Skive as much from new sole as there is material left on old sole so that a neat joint will be made. Be sure to leave the new sole thick enough at the joint to hold the nails which are to fasten it on. After this place the new sole back on the old sole (by guide lines) and fasten it at the shank with three nails. See Diagram No. 9. Fasten the bar of old sole to bar of new sole where they join with a short tack from the inside.

LASTING AND SEWING

Pull the sole through the bottom of upper that is loose and turn the upper on the wrong side. Pull the center of upper over the sole at toe and fasten with tack. Diagram No. 10. Next pull the upper over at side or at tip lines and fasten it. Pull it over next between the tip line and the joint and fasten it.

The portions of upper which are not fastened must be evenly distributed while sewing. Begin sewing about two stitches below where the upper is ripped; bend the sole back to-

wards the heel to tighten the upper. Be very careful in crossing the joint. Do not pull stitch at this point tight enough to get upper out of shape. The bar determines the shape of the shoe, therefore the upper must lay close to it. The awl must come out directly in the angle of the bar and shoulder.



After the shoe is sewed fasten the lap of old sole down with the short flat-head tack. See Diagram No. 10. It is then turned and straightened. Put it on a last and set aside to dry, after which the edges are prepared and set up.

LIST OF TOOLS NECESSARY TO HAVE

1 French Heavy Hammer	$ .50
1 Plain Hammer No. 0	.30
1 Square-Point Knife	.15
1 Lip Knife	.15
1 Eight-inch Rasp	.25
1 Pair of Nippers	.25
1 Welt-Knife	.25
1 Rhan-File	.25
1 Heel Prier	.10
1 Scratch Bone	.10
1 Buffer	.10
1 Knife Sharpener	.15
1 Half Dozen Plain Awl Handles	.10
1 Pegging Awl Handle	.10
	$2.75

The prices of these tools change but little. With the addition of a set of good edge-irons and heel-burnishers, the above list will make a good kit for a shoemaker who works as a journeyman. To start a business, lasts and jacks are necessary.

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